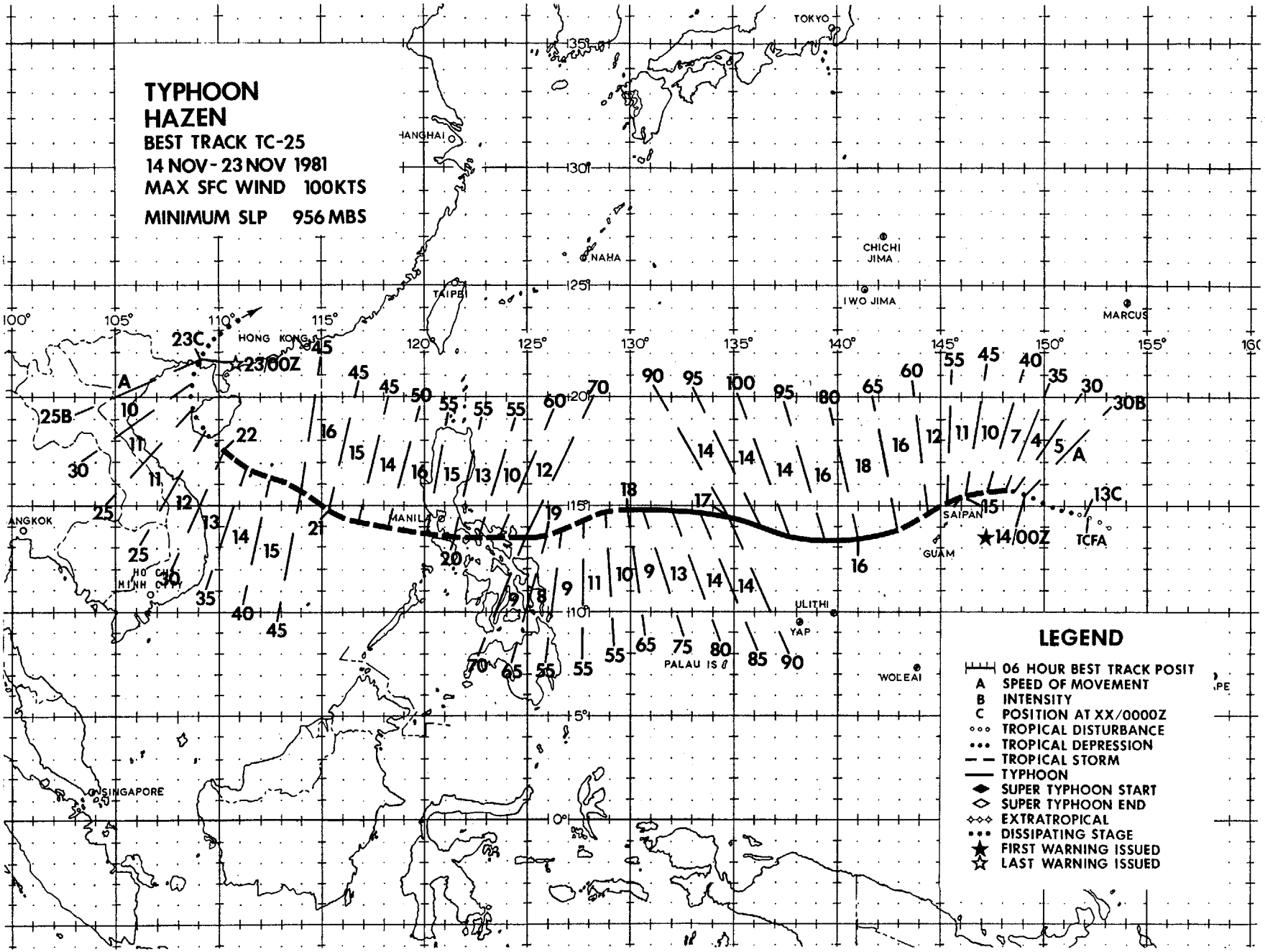
TYPHOON
HAZEN
BEST TRACK TC-25
14 NOV - 23 NOV 1981
MAX SFC WIND 100KTS
MINIMUM SLP 956 MBS
TOKYO
SHANGHAI
NAHA
CHICHI JIMA
IWO JIMA
MARCUS
TAIPEI
HONG KONG
MANILA
SAIPAN
GUAM
TCFA
ULITHI
YAP
WOLEAI
PALAU IS
BANGKOK
SINGAPORE
HO CHI MINH
23C
23/00Z
14/00Z
13C
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED

Following two weeks with no tropical cyclone activity in the northwest Pacific, a disturbance associated with enhanced convection began to develop in an elongated trough east of Guam. At 122347Z, November a Tropical Cyclone Formation Alert (TCFA) was issued as the system's circulation pattern improved and an increase in convection was evident from satellite imagery.

Aircraft reconnaissance on 13 November was not able to close off a circulation, but the convective features and the satellite signature remained strong, so the TCFA was reissued. Aircraft reconnaissance data at 140000Z found a closed circulation with maximum surface winds of 35 kt (18 m/sec), thus the disturbance became Tropical Depression 25, with the first warning being issued at 140200Z. Aircraft reconnaissance later that evening reported the surface pressure had dropped to 990 mb, prompting upgrading to Tropical Storm Hazen with estimated maximum winds of 40 kt (20 m/sec). Satellite imagery at this time showed the development of an intense, 150 nm (278 km) diameter, convective mass.

Forecasts during the early stages of Hazen's rapid development predicted movement to the west-northwest at 7 kt (13 km/hr) in response to weak steering flow in the mid-troposphere. Hazen was expected to become entrained into a frontal boundary associated with a strong mid-latitude low pressure system east of Japan. However, this did not occur; the front weakened and moved to the east. A mid-tropospheric ridge began building behind the front, causing Hazen to take a westward jog and eventually forcing a southwest track as the ridge intensified north of the storm.

Tropical Storm Hazen's southwestward path took it over the northern tip of Saipan between 150300Z and 150600Z (Fig. 3-25-1). Maximum sustained winds of 35 kt (17 m/sec) with gusts to 62 kt (31 m/sec) were reported by the Saipan weather office. Minor structural damage and many downed trees and power lines were reported.

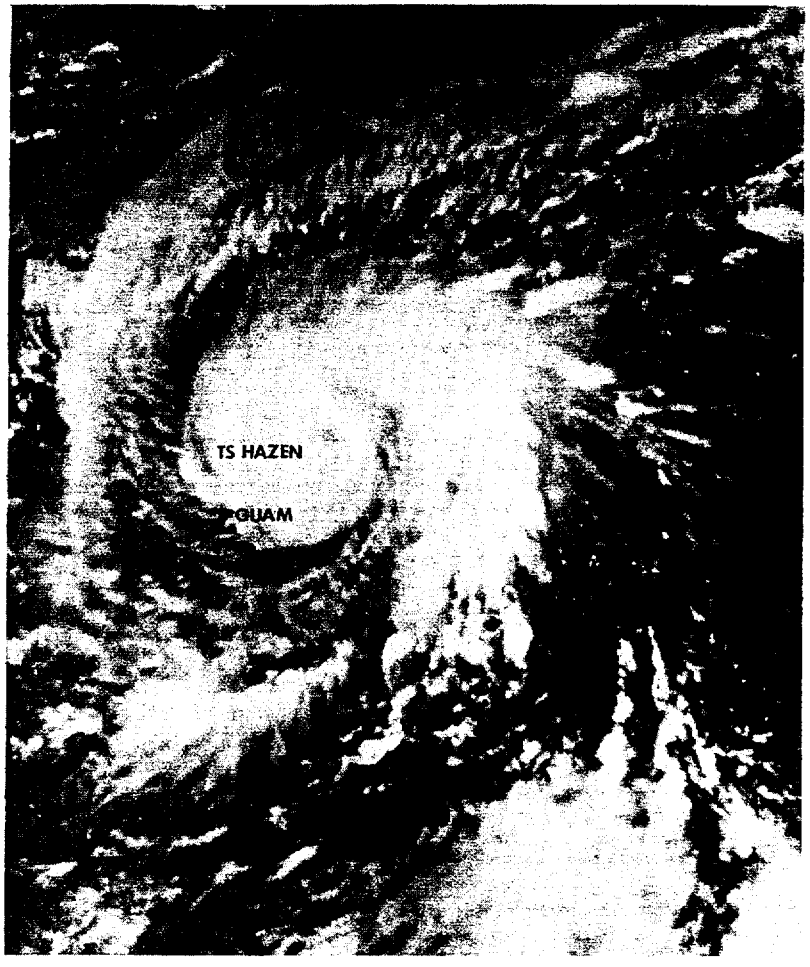

Figure 3-25-1. Tropical Storm Hazen at 55 kt (28 m/sec) intensity 110 nm (204 km) northeast of Guam shortly after crossing Saipan, 150430Z November. (NOAA 7 visual imagery)

Hazen then passed 60 nm (111 km) north of Guam at 151200Z and began a more westerly movement. Winds near the center were estimated to be 55 kt (28 m/sec) at this time but only the weaker southern quadrants passed over Guam, where winds of 15 kt (8 m/sec) were reported with some heavy showers. These synoptic reports provided verification that Hazen was a very compact storm with winds of over 30 kt (15 m/sec) extending no more than 30 nm (56 km) from the center.

Hazen was upgraded to typhoon strength at 151800Z, 3 hours before aircraft reconnaissance reported surface pressures of 957 mb and estimated surface winds of 90 kt (45 m/sec). After passing Guam, Hazen rapidly intensified to his maximum intensity of 100 kt (50 m/sec) as it followed the more westward track. Early on 17 November Hazen began to interact with a mid-latitude trough and was drawn northwestward into an area of increased vertical wind shear. Hazen weakened as the upper-level outflow channels to the north diminished. As the trough passed to the east, Hazen resumed westerly movement and reintensified (Fig. 3-25-2).

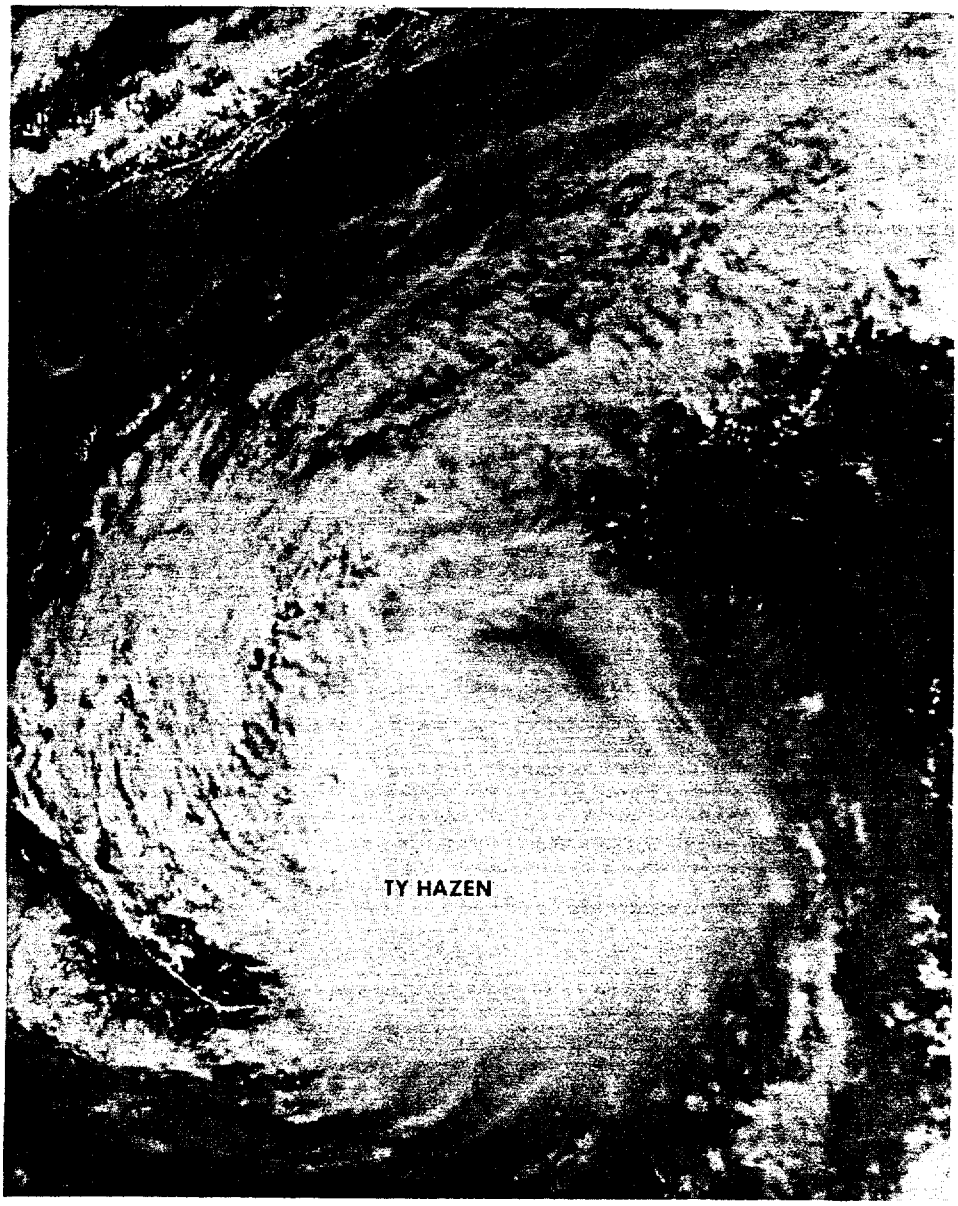

Figure 3-25-2. Typhoon Hazen at 85 kt (43/sec) intensity 640 nm (1185 km) west of Guam. Hazen is seen here interacting with the trough that eventually weakened Hazen to tropical storm strength, 170549Z November. (NOAA 7 visual imagery)

As Hazen approached the Philippines a slow weakening occurred as part of his circulation was interrupted by the mountainous terrain of the islands south of Luzon. Hazen passed just south of Catanduanes Island (WMO 98447) at 191200Z (Fig. 3-25-3) and entered the South China Sea 18 hours later. Highest recorded winds were 65 kt (33 m/sec) at Catanduanes Island. As Hazen entered the South China Sea no intensification occurred over the warm water due in part to the severe interactions between the low-level circulation and the mountainous terrain of southern Luzon; the loss of strength just could not be overcome. Hazen continued to weaken as he tracked toward Hanoi guided by a weakness in the 500 mb ridge that was evident upon the 211200Z streamline analysis. Hazen continued to move toward the weakness, eventually making landfall 150 nm (278 km) east-northeast of Hanoi and then dissipated over the hilly terrain of southeast China.

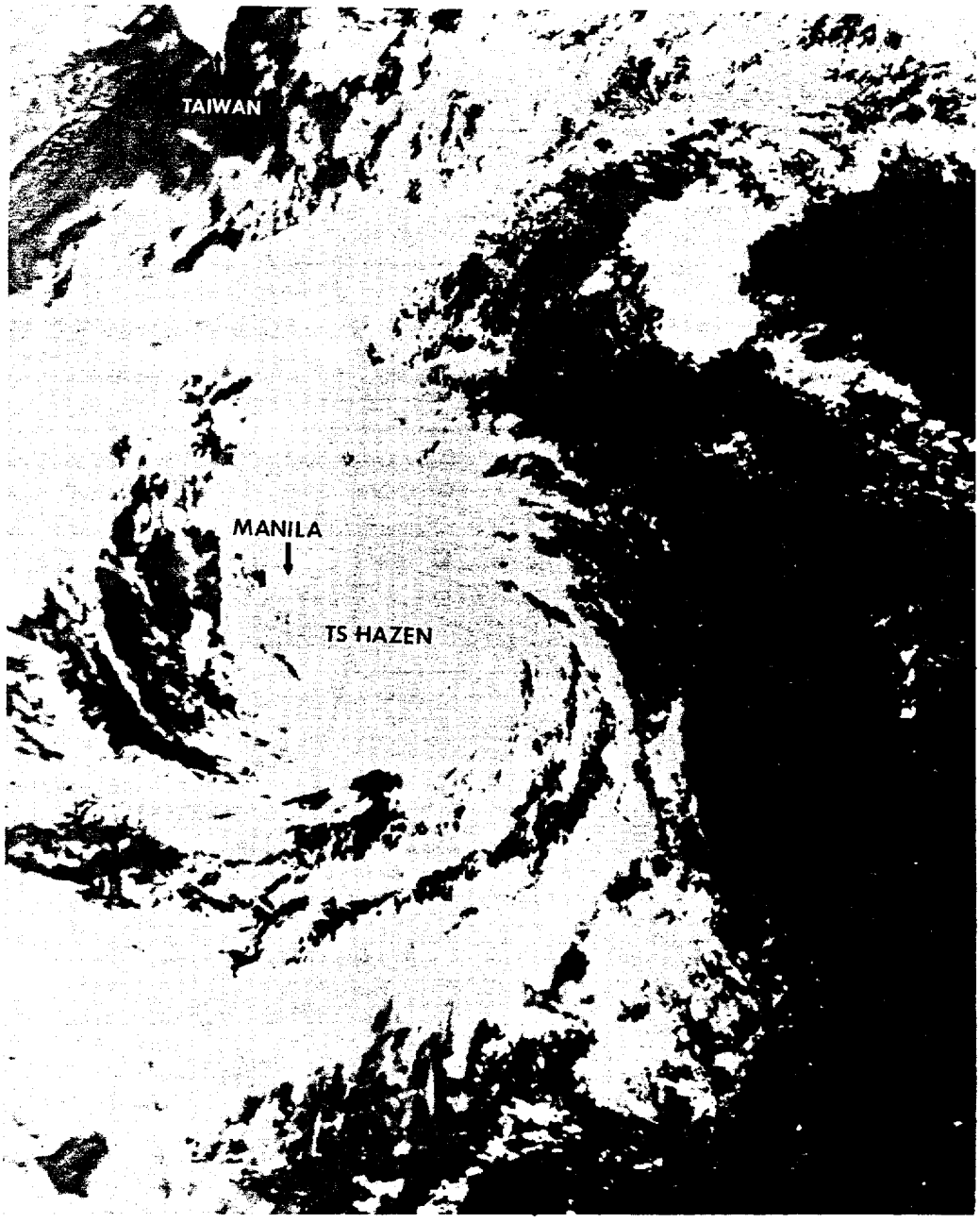

Figure 3-25-3. Tropical Storm Hazen at 55 kt (23 m/sec) 125 nm (232 km) southeast of Manila while moving south of Luzon, 191801Z November. (NOAA 7 infrared imagery)